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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,831	06/13/2001	Ari Hottinen	P 280346 T298101US/PYK/kp	3478
909	7590	08/03/2004	EXAMINER ZHENG, EVA Y	
PILLSBURY WINTHROP, LLP P.O. BOX 10500 MCLEAN, VA 22102			ART UNIT 2634	PAPER NUMBER

DATE MAILED: 08/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/879,831

Applicant(s)

HOTTINEN ET AL.

Examiner

Eva Yi Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-12, 16-31, 33-39, 41, 42 and 46-56 is/are rejected.
- 7) ☒ Claim(s) 8, 13-15, 32, 40 and 43-45 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1-56 are objected to because of the following informalities: miss-spelled word: "singalling" should be changed to --signaling--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1-7, 9-12, 16-31, 33-39, 41, 42, and 46-56 are rejected under 35 U.S.C. 102(e) as being anticipated by Greenstin et al. (6,131,016).

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a) Regarding claim 1, Greenstin et al. disclose a method of transmitting a digital signal from a transmitter to a receiver in a radio system, the method comprising:

the transmitter (10 in Fig. 1) transmitting at least a part of the signal via at least two different transmit antenna paths (15 and 16 in Fig. 1); and

the receiver receiving the signal (20 in Fig. 1);

wherein the transmit power of the signals to be transmitted via different transmit antenna paths is weighted with respect to one another in the transmitter (202a and 203a in Fig. 2A) by means of changeable weighting coefficients determined for each transmit antenna path (Col 4, L53- Col 5, L36).

b) Regarding claim 33, Greenstin et al. disclose a radio system for transmitting a digital signal, comprising:

a transmitter for transmitting a signal (10 in Fig. 1);

at least two transmit antenna paths that can be connected to the transmitter (15 and 16 in Fig. 1);

a receiver for receiving the signal (20 in Fig. 1);

wherein the transmitter comprises

changing means (230 in Fig. 2A) for changing the weighting coefficients determined for each transmit antenna path with respect to one another, and

weighting means (202a and 203a in Fig. 2A) for weighting the transmit power of the signals to be transmitted via different transmit antenna paths (202 and 203 in Fig. 2A) by means of weighting coefficients that can be changed with respect to one another.

c) Regarding claims 2 and 34, Greenstin et al. disclose the receiver performs measurements on the received signals that were transmitted via the different transmit antenna paths (as shown in Fig.1);

the receiver signals to the transmitter the weighting coefficient data formed on the basis of the measurements (280 in Fig. 2B);

the transmitter (220 in Fig. 2A) forms weighting coefficients by means of the weighting coefficient data signaling (201 in Fig. 2A; Col 3, L34-37).

d) Regarding claims 3 and 35, Greenstin et al. disclose the transmitter forms a quality value for the weighting coefficient data signaling it has received (230 in Fig. 2A);

the transmitter forms weighting coefficients by means of the quality value of the weighting coefficient data signaling and the signaling itself (201, 202a and 203a in Fig. 2A).

e) Regarding claims 4 and 36, Greenstin et al. disclose the values of the weighting coefficients are predetermined, and the predetermined values of the weighting coefficients are divided into different groups, each of which has a particular weighting coefficient for each transmit antenna path, the weighting coefficient data signaling comprising information about which group of weighting coefficients the receiver wants to be used (output signal from 201 in Fig. 2A feed into 202a and 203a inherent as predetermined coefficient).

f) Regarding claims 5 and 37, Greenstin et al. disclose the weighting coefficient data comprises information about the transmit antenna path via which the signal with the best quality value was transmitted (Col 4, L 53- Col 5, L6).

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- g) Regarding claims 6 and 38, Greenstin et al. disclose the weighting coefficient data comprises differential information indicating how the ratios of the weighting coefficients for the transmit antenna paths are changed differentially (Col 5, L7-24).
- h) Regarding claims 7 and 39, Greenstin et al. disclose the weighting coefficient data comprises at least one channel parameter measured by the receiver (as shown in Fig. 2A).
- i) Regarding claim 9, Greenstin et al. disclose the weighting coefficients used in the transmission are signalled to the receiver (as shown in Fig. 1 and 2A).
- j) Regarding claim 10, Greenstin et al. disclose the weighting coefficients are signalled to the receiver by means of an identification sequence which is inserted in the transmitted signal and which varies depending on the weighting of the signal (Col 5, L7-24).
- k) Regarding claim 11, Greenstin et al. disclose the weighting coefficients are signalled to the receiver by means of modulation, spreading or coding of the signal specifically for each transmit antenna path (230 in Fig. 2A; Col 4, L53 - Col 5, L36).
- l) Regarding claim 12, Greenstin et al. disclose the identification data for the group of weighting coefficients used in the transmission is signalled to the receiver by means of identification bits inserted in the transmitted signal (230 in Fig. 2A).
- m) Regarding claims 16 and 46, Greenstin et al. disclose signals to be transmitted via two different transmit antenna paths are as mutually orthogonal as possible (Col 1, L48-51).

- n) Regarding claim 17, Greenstin et al. disclose the orthogonality is implemented by using a different spreading or channel code for each transmit antenna path (Col 1, L51-62).
- o) Regarding claim 18, Greenstin et al. disclose the orthogonality is implemented by using a different transmission frequency for each transmit antenna path (Col 1, L48-51; OFDM by definition is a method of digital modulation in which a signal is split into several channels at different frequencies).
- p) Regarding claim 19, Greenstin et al. disclose the orthogonality is implemented by using a different slot for each transmit antenna path (Fig. 1).
- q) Regarding claims 20 and 47, Greenstin et al. disclose the signal is coded in order to minimize transmission errors in the transmission channel (Col 1, L48-51; "OFDM").
- r) Regarding claims 21 and 48, Greenstin et al. disclose the coding is space time coding (Col 1, L48-51; space time coding employ OFDM).
- s) Regarding claims 22 and 49, Greenstin et al. disclose the space-time coding is space-time block coding (Col 1, L48-51; OFDM, a type of transmit diversity inherent to employ space-time block coding).
- t) Regarding claims 23 and 50, Greenstin et al. disclose the space-time coding is space-time trellis coding (Col 1, L48-51; OFDM, a type of transmit diversity inherent to employ space-time trellis coding).
- u) Regarding claims 24 and 51, Greenstin et al. disclose the transmit antenna paths are connected to one base station of the network part in the radio system (Fig. 1).

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v) Regarding claims 25 and 52, Greenstin et al. disclose the transmitter is situated in a radio network subsystem (RNS) of the radio system network part (10 in Fig. 1), and the receiver is situated in a user equipment (UE) of the radio system (20 in Fig. 1).

w) Regarding claims 26 and 53, Greenstin et al. disclose a user equipment (UE) of the radio system determines the weighting coefficients (202a and 203a in Fig. 2A) used by the network part of the radio system in transmitting to the user equipment (UE) in question (as shown in Fig. 2A).

x) Regarding claims 27 and 54, Greenstin et al. disclose the network part of the radio system determines itself the weighting coefficients it uses in transmission (230 in Fig. 2A).

y) Regarding claims 28 and 55, Greenstin et al. disclose the network part of the radio system takes into account the loading of each power amplifier (202e and 203e in Fig. 2A) over the transmit antenna path when it makes the decision.

z) Regarding claim 29 and 56, Greenstin et al. disclose a transmit antenna path is implemented by means of an antenna structure that provides phasing (Col 4, L1-12).

A) Regarding claim 30, Greenstin et al. disclose the phasing is determined by means of channel parameters signalled by the receiver (220 in Fig. 2A).

B) Regarding claim 31, Greenstin et al. disclose wherein the phasing of transmission is determined by means of signals that have arrived at the same antenna elements (230 in Fig. 2A).

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C) Regarding claim 41, Greenstin et al. disclose the transmitter comprises means for signaling the weighting coefficients used in the transmission to the receiver by means of pilot bits inserted in the transmitted signal (Col 4, L8-11).

Allowable Subject Matter

4. Claims 4, 13-15, 32, 40, and 43-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Yi Zheng whose telephone number is 703-305-8699. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-879-9306.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

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Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Eva Yi Zheng
Examiner
Art Unit 2634

July 21, 2004



SHUWANG LIU
PRIMARY EXAMINER